

What is claimed is:

1. A polymeric coating for a substrate comprising:

water, a biocompatible visualization agent that reflects or emits light at a wavelength detectable to a human eye, and a biodegradable hydrogel, with the hydrogel having an interior and an exterior, with the exterior having a substrate coating surface, and the visualization agent being at least partially disposed within the interior.

2. The polymeric coating of claim 1, wherein the substrate comprises tissue and the coating is tissue adherent.

3. The polymeric coating of claim 1, wherein the hydrogel comprises crosslinked polymers that are selected from the group consisting of collagen, fibrinogen, albumin, and fibrin.

4. The polymeric coating of claim 1, wherein the hydrogel is made of synthetic materials.

5. The polymeric coating of claim 1, wherein the hydrogel is hydrolytically biodegradable.

6. The polymeric coating of claim 1, wherein the hydrogel comprises crosslinked hydrophilic polymers having chemical crosslinks identifiable as products of an electrophilic functional group-nucleophilic functional group reaction.

7. The polymeric coating of claim 6, wherein the crosslinked hydrophilic polymers comprise polyethylene glycol and a hydrolytically biodegradable portion chosen from the group consisting of an ester, amide, or carbonate linkage.

8. The polymeric coating of claim 1, wherein the hydrogel comprises covalently crosslinked hydrophilic polymers.

9. The polymeric coating of claim 1, wherein the visualization agent is chosen from the group consisting of FD&C Blue #1, FD&C Blue #2, methylene blue, indocyanine green, visualization agents that provide a blue color, and visualization agents that provide a green color.

10. The polymeric coating of claim 1, wherein the visualization agent is covalently linked to the hydrogel.

11. The polymeric coating of claim 1, wherein the hydrogel has an average thickness between about 0.1 and about 10.0 mm.

12. The polymeric coating of claim 1, wherein the hydrogel comprises a biologically active agent.

13. A method of preparing a composition suitable to coat a tissue of a patient, the method comprising:

mixing reactive precursor species comprising nucleophilic functional groups, reactive precursor species comprising electrophilic functional groups, and a visualization agent such that the nucleophilic functional groups and electrophilic functional groups crosslink after contact with the tissue to form a hydrogel having an interior and an exterior, with the exterior having at least one substrate coating surface and the visualization agent being at least partially disposed within the interior and reflecting or emitting light at a wavelength detectable to a human eye.

14. The method of claim 13, wherein the hydrogel forms within 60 seconds after contact with the substrate.

15. The method of claim 13, wherein the hydrogel forms within 5 seconds after contact with the substrate.

16. The method of claim 13, wherein the biodegradable hydrogel is adherent to the tissue.

17. The method of claim 13, further comprising:

applying the hydrogel onto the tissue until an average thickness is reached in which the color of the hydrogel indicates that a predetermined thickness of hydrogel has been deposited on the tissue.

18. The method of claim 17, comprising choosing the predetermined thickness to be about 0.5 to about 4.0 mm.

19. The method of claim 17, comprising choosing at least one of the reactive precursor species to have a hydrolytically biodegradable portion such that the hydrogel is biodegradable.

20. A hydrogel composition adapted for use with a tissue of a patient, the composition being made by the process of claim 16.

21. A kit for making a hydrogel composition adapted for use with a tissue of a patient comprising:

a biocompatible visualization agent and at least two chemically distinct and separately packaged reactive precursor species wherein the reactive precursor species may be combined to form a biodegradable hydrogel within less than 60 seconds after contact with the tissue of the patient.

22. The kit of claim 21, wherein at least one of the reactive precursor species comprises a hydrolytically biodegradable portion.

23. The kit of claim 21, comprising a biologically active agent.

24. A composition for coating a tissue of a patient comprising:

biocompatible means for visualization and reactive precursor species means for forming a biodegradable hydrogel coating after contact with the tissue, with the hydrogel having an interior and an exterior, with the exterior having at least one substrate coating surface, wherein the visualization agent is at least partially disposed within the interior and reflects or emits light at a wavelength detectable to a human eye.

25. A polymeric coating for a substrate comprising:

water, a biocompatible visualization agent that reflects or emits light at a wavelength detectable to a human eye, and a hydrogel having an interior and an exterior, with the exterior having a substrate coating surface, and the visualization agent being at least partially disposed within the interior.

26. The polymeric coating of claim 25, wherein the substrate comprises tissue and the coating is tissue adherent.

27. The polymeric coating of claim 25, wherein the biocompatible visualization agent is chosen from the group consisting of FD&C Blue #1, FD&C Blue #2, FD&C Blue #3, FD&C Blue #6, methylene blue, indocyanine green, visualization agents that provide a blue color, and visualization agents that provide a green color.

28. A method for formulating a polymer composition that crosslinks to form a hydrogel, the method comprising selecting a concentration of visualization agent for the polymer composition that results in a visually observable change when the polymer composition is applied to a substrate at a predetermined thickness.

29. The method of claim 28, wherein the predetermined thickness is from about 0.1 mm to about 10.0 mm.

30. The method of claim 28, wherein the observable change is not being able to see the substrate through the polymer composition.

31. The method of claim 28, wherein the observable change is not being able to see patterns in the substrate surface through the polymer composition.

32. The method of claim 28, wherein the polymer composition comprises electrophilic functional group functional groups and nucleophilic functional group functional groups that crosslink to each other.

33. The method of claim 32, wherein the polymer composition crosslinks to form a hydrogel within about 60 seconds after being applied to a substrate.

34. The method of claim 28, further comprising mixing the visualization agent at a selected concentration with reactive precursor species.

35. The method of claim 28, further comprising a biologically active agent.